

Study of flow of superfluid He-II very near T_λ

Yury Mukharsky^b, Kalyani Sukhatme^a, David Pearson^a, and Talso Chui^a

^aJet Propulsion Laboratory, California Institute of Technology, Pasadena, CA 91109, USA

^bCEA-DRECAM, SPEC, Centre d'Études de Saclay, 91191 Gif-sur-Yvette, CEDEX, France

We report here, preliminary data from an experiment studying flow of **superfluid helium** through a slit orifice (of sub-micron width) very close to T_λ . Critical supercurrent (I_c) data is obtained from a step function drive to the diaphragm in a **Helmholtz resonator** cell. The superfluid density (ρ_s) data can be obtained from the resonant frequency of the Helmholtz oscillator, as determined by transfer function of the resonator or from the free ringing after the step function excitation. Preliminary data shows that $\rho_s \sim t^{0.73}$, where t is the reduced temperature and that the $I_c \sim \rho_s^{1.38}$. However, the magnitude of I_c is much larger than expected, indicating a possible parallel flow path. Further investigations are in progress. The work is being carried out at JPL, California Institute of Technology under contract to NASA.

Flow experiment

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Contact person:
Kalyani Sukhatme

Address:
Jet Propulsion lab, M/S 79-24
California Institute of Technology
4800 Oak Grove Drive
CA 91109
Pasadena
USA

Email: kalyani@squid.jpl.nasa.gov
Fax: +01-818-3934878
Phone: +01-818-3542524